

Bronco Creek flood 1971

the pleasure of learning
something new

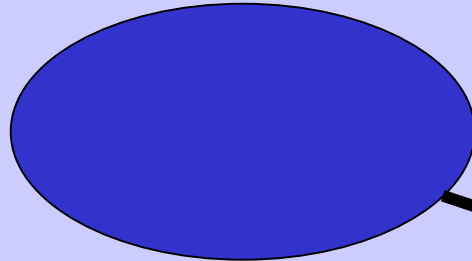
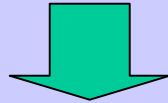
Significance of
translatory waves for peak
discharge reconstructions

Discharge Estimates

96,800	Original 4-sec SA using $n=.030$
73,500	USGS Published $n=.040$
38,000	KS est by Hjalmarson
28,000	Prof. Carmody UofA 1980 General report #1 of College of engineering
28,200	Grad student Kyle House & Phil Pearthree of AzGS
96,800	Translatory wave & flood peak

RAINFALL-RUNOFF CONSIDERATION

1"/hour



640 cfs/mi²

at 3"/45 min or 4"/hr and $A=19$ mi²

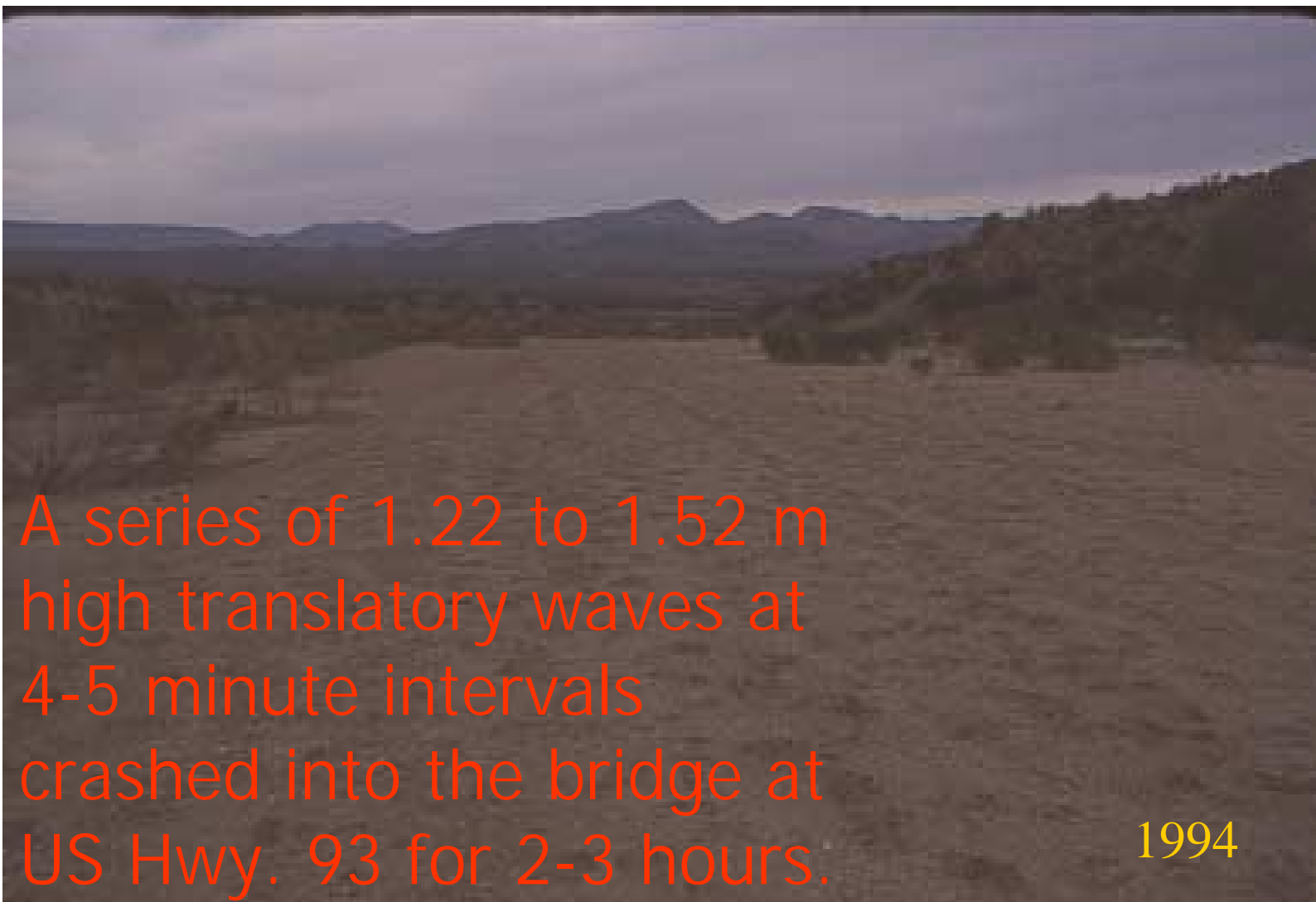
ASSUME CONC. TIME < 45 min

$$\text{peak} = 640 \times 4 \times 19 = 49,000 \text{ ft}^3/\text{s}$$

49,000 ft³/s

96,800	Original 4-sec SA using $n=.030$
73,500	USGS Published $n=.040$
38,000	KS est by Hjalmarson
28,000	Prof. Carmody UofA 1980
?	General report #1 of College of engineering
28,200	Grad student Kyle House & Phil Pearthree of AzGS
96,800	Translatory wave & flood peak

During the afternoon of August 19, 1971, an intense thunderstorm a few miles southwest of Wikieup, Arizona, produced one of the largest known peaks for a 49.2 km² drainage basin.

A photograph of a coastal landscape. In the foreground, there is a sandy beach with some sparse vegetation. In the middle ground, a body of water is visible, and in the background, a range of mountains or hills is silhouetted against a cloudy sky. The text is overlaid on the lower left portion of the image.

A series of 1.22 to 1.52 m
high translatory waves at
4-5 minute intervals
crashed into the bridge at
US Hwy. 93 for 2-3 hours.

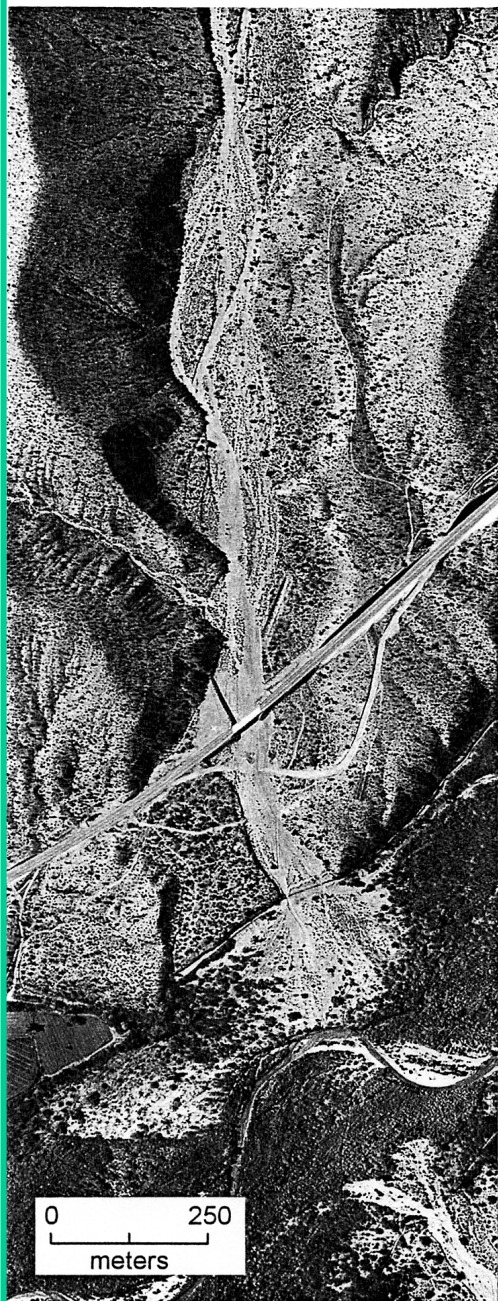
1994

BRONCO CREEK WATERSHED

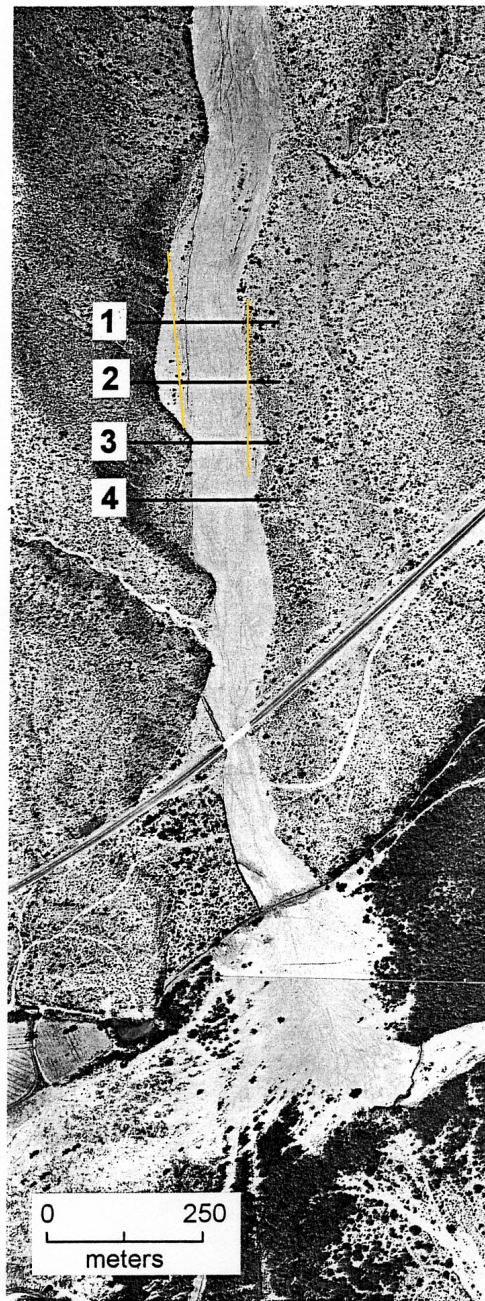
(NOT TO SCALE)



November, 1963



September, 1971



SLOPE-AREA ESTIMATE

~~96,800 Original 4-sec SA using $n=.030$~~

73,500 USGS Published $n=.040$

Straight reach

Slope = 0.03

No obvious signs of scour and fill in reach

Obvious scour at bridge 1,000 ft dwnstr.

Froude # 1.3-1.8

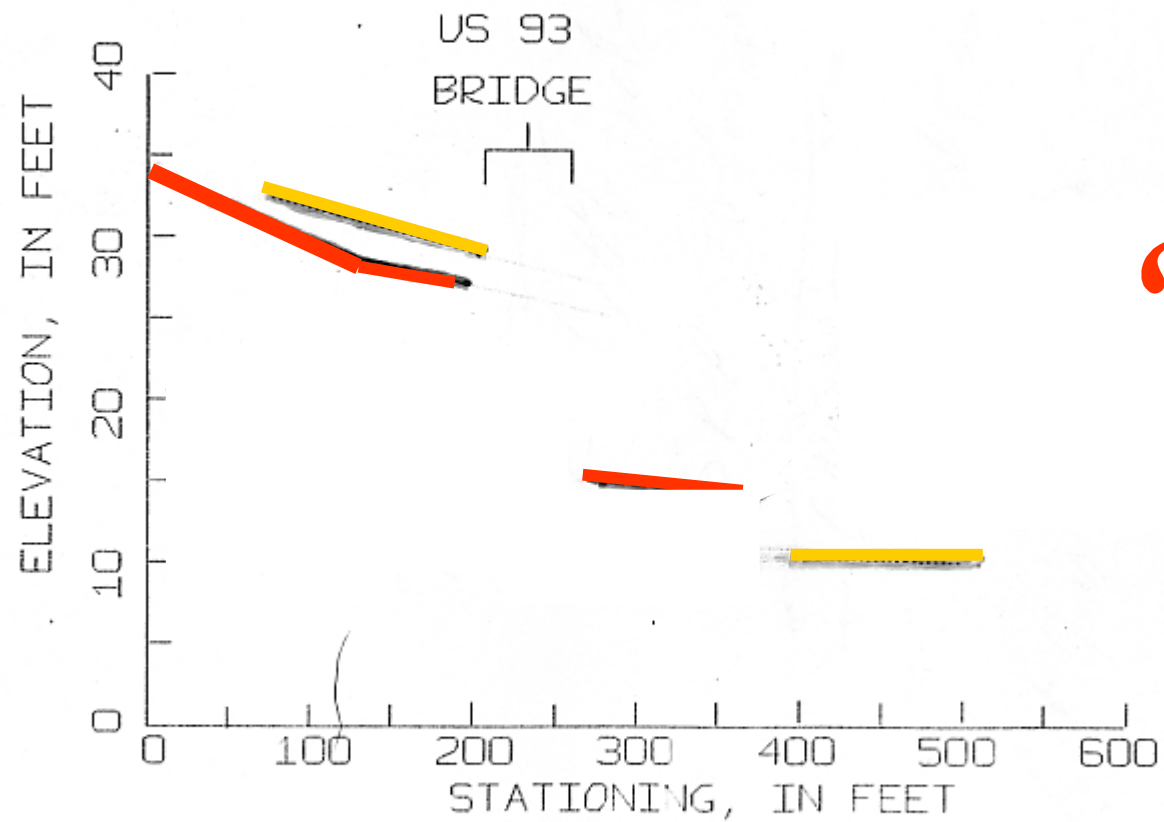
$D_{50} = 0.8\text{mm}$

**BRONCO CREEK
US HWY 93 BRIDGE**

93 - 125.95
Bronco Wash
Aug. 20 1971
Looking Downstream



ESTIMATED FLOOD PROFILES AT BRIDGE



**BRONCO CREEK HWY 93
RIGHT ABUTMENT**



93-125.95
Bronco Wash
Aug 20, 1971
South Abut.
Looking Downstream

BRONCO CK LEFT ABUT.



93 - 125.45
Bronco Wash
Aug. 20, 1971

South Abut.
Looking Upstream

BRONCO CK HWY 93
LOOKING NORTH



93 - 125.95
Bronco Wash
Aug 20, 1971
Looking North

BRONCO CREEK US HWY 93 BRIDGE



1994



1994



1994



1994

BRONCO CREEK WATERSHED (NOT TO SCALE)



**BRONCO WASH CONVEYANCE-SLOPE SITE
HJALMARSON 1971**



1994

1971

~~96,800~~ ~~Original 4-sec SA using $n=.030$~~

73,500 USGS Published $n=.040$

38,000 KS est by Hjalmarson (sum of
3 tributaries)

1980

28,000 Prof. Carmody UofA

1994

Winn meets Kyle House at a conference.

Kyle asks about candidate sites where he might apply paleoflood methods.

Winn describes Bronco Creek, the reported waves, the revised roughness coefficients and the "world record Q ".

Fresh meat for a Ph.D. candidate!

BRONCO CREEK WATERSHED

(NOT TO SCALE)



1971

96,800 Original 4-sec SA using
n=.030

73,500 USGS Published n=.040
38,000 KS est by Hjalmarson

1980

28,000 Prof. Carmody UofA

1995

28,200 Grad student Kyle House &
Phil Pearthree of AzGS

Houston,
we have a problem!